Name: $\qquad$
July 16, 2009
MATH 1012 Midterm
You may use a calculator. You may not use any notes or books. Per the CU Honor code you may neither give nor receive unauthorized assistance.

1. Convert a speed of 4 miles per hour into units of feet per minute. Note that 1 mile $=$ 5280 feet and 1 hour $=60$ minutes.
2. Make an order of magnitude estimate for how many hours the average person sleeps in a lifetime. Show your work. Any reasonable answer will be accepted as long as the work is complete and correct. Answer in scientific notation.
3. Consider the following argument:

Premise: Everyone who goes to work walks to work.
Premise: Sam went to work today.
Conclusion: Sam walked to work.
(a) Is the argument deductive or inductive?
(b) If applicable, is the argument valid?
(c) If applicable, is the argument sound?
4. Consider the following argument:

Premise: Since I moved to my new apartment last year, my neighbors have had parties every Saturday night.
Premise: Tomorrow is Saturday.
Conclusion: My neighbors will have a party tomorrow night.
(a) Is the argument deductive or inductive?
(b) If applicable, is the argument valid?
(c) If applicable, is the argument sound?
5. In the last year, the U.S. unemployment rate rose from $5 \%$ to $9 \%$.
(a) What was the absolute change in the unemployment rate? (Your answer should have units of "percentage points")
(b) What was the relative change in the unemployment rate? Your answer should be written in the form of a percentage.
6. Let $A$ be the set of all negative integers, let $B$ be the set of all natural numbers, and let $C$ be the set of all integers.
(a) Draw a Venn diagram showing the relationship between the sets $A, B$, and $C$.
(b) Describe the numbers (if any) in set $C$ but neither in $A$ nor $B$.
(c) Give an example of a number that is not in any of the sets $A, B$, or $C$.
7. Write the following numbers in scientific notation:
(a) 103,800
(b) . 023
(c) $35 \%$
8. Boulder's average yearly rainfall is $70 \%$ less than the average yearly rainfall in Portland. If the average yearly rainfall in Portland is 60 inches, what is the average yearly rainfall in Boulder?

